REMARKS

The Office Action mailed June 12, 2008, and made final, has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 10-20 are now pending in this application. Claims 1-9 have been cancelled. Claims 10-20 stand rejected.

The rejection of Claim 10 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. No. 6,823,878 to Gadini (hereinafter referred to as "Gadini") in view of U.S. Pat. No. 5,878,603 to Warren, Jr. et al. (hereinafter referred to as "Warren") and U.S. Pat. No. 4,120,032 to Mirdadian (hereinafter referred to as "Mirdadian") is respectfully traversed.

Gadini describes a control system for softening water and channeling the water to a dishwasher. The dishwasher includes a tub (1) and an inlet duct (8) that is in flow communication with a main water supply and the tub (1). A decalcification system (10) is coupled between the inlet duct (8) and the tub (1). The decalcification system (10) includes water-softening resins (R) and a collecting tank (17). The water is channeled from the inlet duct (8) to the tank (17) and the resins (R). Softened water flows from the resins (R) into the tub (1). To regenerate the resins (R), valves (9, 11, 13, 15, 18, and/or 20) control the flow of water from the tank (17) through the resins (R) while preventing water from being discharged into the tub (1). After regeneration, the valves (9, 11, 13, 15, 18, and/or 20) refill the tank (17) and allow softened water to be discharged within the tub (1). A control system controls operation of the tub (1), the tank (17), the decalcification system (10), and the valves (9, 11, 13, 15, 18, and 20). A standard turbine flow meter may be used to meter a flow of water within the tub (1).

Further, a metering tank (26) may be positioned downstream from an air break (AB) in the inlet duct (8). The metering tank (26) meters the flow of water to the tub (1) through a series of discharges into the collection tank (17) and/or the decalcification system (10). A flow sensor (27), such as a turbine flow-rate sensor, is coupled to the inlet duct (8) upstream from the air break (AB). To supply and discharge the tank (26), a predetermined amount of

water required for filling the tanks (17 and 26), the ducts (8, 19, and 12), and the decalcification system (10) is properly coded within suitable memory means of the control system. The amount of water is detected by the flow sensor (27) and is output as a gradually increasing value signal. The control system compares the increasing signal to the predetermined amount stored therein. When the two values coincide, the control system closes the valves (9 and 20). Notably, Gadini does not describe or suggest a controller in signal communication with a turbine ratemeter, wherein the controller is configured to close a valve when a predetermined number of pulses have been received from the turbine ratemeter such that a predetermined quantity of water is supplied through the valve.

Further, although Gadini describes that a water flow may be metered using a standard turbine flow meter, Gadini does not describe or suggest the type of output of the turbine flow meter. Further, Gadini describes that the flow sensor (27), which may be a turbine flow-rate sensor, outputs a signal having a gradually increasing value that is compared to a predetermined amount. A gradually increasing value signal is not equivalent to a signal having a plurality of square wave pulses, wherein each pulse represents a predetermined quantity of water.

As such, Applicants respectfully traverse the Examiner's assertion at page 4 of the Office Action that "the claimed ratemeter is equivalent to turbine [*sic*] flowmeter of Gadini since both are measuring volume [*sic*] of liquid [*sic*]." Rather, Applicants respectfully submit that the turbine flow meter described in Gadini is not equivalent to the turbine ratemeter recited in the presently pending claims. More specifically, Gadini merely describes that a standard turbine flow meter may be used to meter the flow of softened water into a tub. Applicants respectfully submit that a turbine flow meter may have one of several types of outputs, including analog voltage, analog current, frequency or pulse, and switch. Gadini does not describe or suggest what type of signal the standard turbine flow meter outputs although, in one embodiment, Gadini describes a flow sensor that outputs a signal having a gradually increasing value. A signal having a gradually increasing value is not a signal having a plurality of square wave pulses. Accordingly, the turbine flow meter and/or the

flow sensor described in Gadini do not count a pulse and, as such, are not equivalent to the recited turbine ratemeter.

Further, Applicants respectfully submit that Mirdadian does not make up for the deficiencies of Gadini. As discussed below, Mirdadian describes a flowmeter that may be any one of a turbine meter, a positive displacement meter, or any other suitable metering or measuring device. Mirdadian does not describe or suggest using a turbine meter in a dishwasher to regulate the amount of water entering the dishwasher. Further, neither Gadini nor Mirdadian, considered alone or in combination, describes or suggests how the digital, temperature-compensated, square wave pulse train of Mirdadian would be combined with the flow sensor of Gadini to output a gradually increasing signal for the dishwasher of Gadini to perform the operations described in Gadini. Moreover, the square wave pulse train, as described in Mirdadian, teaches away from the signal with a gradually increasing value, as described in Gadini. As such, Applicants respectfully submit that it would not be obvious to one of ordinary skill in the art to modify Gadini with Mirdadian to arrive at the presently claimed invention. Accordingly, Gadini does not describe or suggest a turbine ratemeter configured to meter a quantity of water flow through a valve and generate a signal having a plurality of square wave pulses representing the quantity of water flow through the valve, wherein each pulse of the plurality of square wave pulses represents a predetermined quantity of water.

Warren describes a quiet fill water system for a washing machine (110). The washing machine (110) includes a washing tub (18) having an entry port (32) disposed within an outer wall (20), a valve (12) having a water inlet (22) and a water outlet (24), and a water reservoir (58) coupled to the outer wall (20). The water reservoir (58) includes a tube entry port (64), a cup-shaped body portion (60), and a water flow port (62). The water flow port (62) is mated with the outer wall entry port (32) to provide fluid communication between the water reservoir (58) and the washing tub (18). The washing machine (110) also includes a capillary tube (50) having a first end (52), a second end (56), and a tip portion (66). The first end (52) is coupled to the water outlet (24) of the valve (12), and the second end (56) is positioned within the tube entry port (64) such that the tip portion (66) is within the body portion (60) of

the water reservoir (58) at a lower position relative to the water flow port (62). Such configuration forms a quiescent reservoir (70) of water during a fill period to decrease the level of noise of the fill period. Notably, Warren does not describe or suggest a controller in signal communication with a turbine ratemeter, wherein the controller is configured to close a valve when a predetermined number of pulses have been received from the turbine ratemeter such that a predetermined quantity of water is supplied through the valve.

Mirdadian describes a system that employs flowmeters to measure a fluid's flow rate through a metered flowline and transducers to measure a temperature of the fluid. The flowmeters generate a series of pulses at a frequency which is representative of a measured volume of fluid. An output device counts the pulses to determine a total volume of the fluid. A compensating totalizer system (10) measures a volume of a fluid flowing through a flowline (11). The system (10) standardizes the volume measurement to a selected temperature and corrects the measurement for abnormalities. The system (10) includes a flowmeter (12), which may be a turbine meter, a positive displacement meter, or any other suitable metering or measuring device. Further, the flowmeter (12) is preferably of the type that generates an electrical square wave pulse representative of the passage of a known incremental volume of fluid through the flowline (11). The flowmeter (12) outputs a square wave pulse train to a temperature multiplier (14). The multiplier (14) multiplies the flowmeter pulse train signal with a binary-coded-decimal change in temperature value (BCD ΔT) value, and a resulting output signal from the multiplier (14) is a digital, temperature-compensated, square wave pulse train. Notably, Mirdadian does not describe or suggest a controller in signal communication with a turbine ratemeter, wherein the controller is configured to close a valve when a predetermined number of pulses have been received from the turbine ratemeter such that a predetermined quantity of water is supplied through the valve.

Claim 10 recites a dishwasher comprising "a wash chamber; a water supply line in flow communication with said wash chamber, said water supply line having a first diameter; a valve configured to deliver water from said water supply line into said wash chamber; a turbine ratemeter in flow communication with said valve, said turbine ratemeter configured to

meter a quantity of water flow through said valve and generate a signal comprising a plurality of square wave pulses representing the quantity of water flow through said valve, each pulse of said plurality of square wave pulses representing a predetermined quantity of water; a restrictor tube in flow communication with said turbine ratemeter, said restrictor tube having a second diameter smaller than said first diameter; and a controller in signal communication with said turbine ratemeter, said controller configured to: open said valve; receive the generated signal from said turbine ratemeter; and close said valve when a predetermined number of pulses have been received from said turbine ratemeter such that a predetermined quantity of water is supplied through said valve."

None of Gadini, Warren, and Mirdadian, considered alone or in combination, describe or suggest a dishwasher as recited in Claim 10. More specifically, none of Gadini, Warren, and Mirdadian, considered alone or in combination, describe or suggest a dishwasher that includes a controller in signal communication with a turbine ratemeter, wherein the controller is configured to close a valve when a predetermined number of pulses have been received from the turbine ratemeter such that a predetermined quantity of water is supplied through the valve. Rather, in contrast to the present invention, Gadini describes a control system configured to compare a gradually increasing signal to a predetermined amount, and, when the two values coincide, close valves, Warren describes a capillary tube having a first end coupled to a water outlet of a valve and having a tip portion within a cup-shaped body portion of a water reservoir such that a quiescent reservoir of water is formed within the body portion, and Mirdadian describes a flowmeter that generates an electrical square wave pulse representative of the passage of a known incremental volume of fluid through a flowline.

Accordingly, for at least the reasons set forth above, Claim 10 is submitted to be patentable over Gadini in view of Warren and Mirdadian.

For at least reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claim 10 be withdrawn.

The rejection of Claims 11-20 under 35 U.S.C. § 103(a) as being unpatentable over Gadini in view of U.S. Patent No. 5,330,580 to Whipple, III et al. (hereinafter referred to as "Whipple"), Warren, and Mirdadian is respectfully traversed.

Gadini, Warren, and Mirdadian are described above. Gadini further describes storing in a control system a predetermined amount of water initially required to fill the tanks (17 and 26), the ducts (8, 19, and 12), and the decalcification system (10). A second water quantity is also stored in the control system. The second water quantity is the difference between a total amount of water to be supplied to the tub (1) during a wash cycle and the predetermined amount of water initially required. The second water quantity is used to refill the metering tank (26) after water has been discharged into the tub (1) from the metering tank (26). The metering tank (26) is serially refilled and discharged until the total amount of water required for a wash cycle has been supplied to the tub (1). As such, the second water quantity corresponds to the same wash cycle to which the predetermined amount of water initially required corresponds. Accordingly, Gadini does not describe or suggest retaining a second total amount of additional water added during *a second dishwashing cycle* and/or determining a second amount of water to deliver to a dishwasher for *a third dishwashing cycle* subsequent the second dishwashing cycle. Further, Gadini does not describe or suggest a controller in signal communication with a turbine ratemeter, wherein the controller is configured to close a valve when a predetermined number of pulses have been received from the turbine ratemeter such that a predetermined quantity of water is supplied through the valve.

Whipple describes a dishwasher (10) that includes a device (60) having a sensor for detecting power consumption surges of a pump motor (75) as a frame (20) receives water channeled from a water source through a valve (30). A pump (70) having the pump motor (75) is used to supply water to the frame (20). The power consumption surges are generated by cavitation within the water, which indicates that less than a sufficient amount of water has been received by the frame (20) for a particular wash cycle. The device (60) uses a controller (200) to control the valve (30) to channel an amount of additional water through the valve (30) such that the cavitation is reduced. The cavitation of the water and the power consumption of the pump motor (75) are reduced as the frame (20) receives an amount of

water sufficient for the wash cycle. Notably, Whipple does not describe or suggest a controller in signal communication with a turbine ratemeter, wherein the controller is configured to and close a valve when a predetermined number of pulses have been received from the turbine ratemeter such that a predetermined quantity of water is supplied through the valve. Further, Whipple does not describe or suggest retaining a second total amount of additional water added during a second dishwashing cycle and/or determining a second amount of water to deliver to a dishwasher for a third dishwashing cycle subsequent the second cycle.

Claims 11-13 depend from independent Claim 10, which is recited above.

None of Gadini, Whipple, Warren and Mirdadian, considered alone or in combination, describe or suggest a dishwasher as recited in Claim 10. More specifically, none of Gadini, Whipple, Warren and Mirdadian, considered alone or in combination, describe or suggest a dishwasher that includes a controller in signal communication with a turbine ratemeter, wherein the controller is configured to and close a valve when a predetermined number of pulses have been received from the turbine ratemeter such that a predetermined quantity of water is supplied through the valve. Rather, in contrast to the present invention, Gadini describes a control system configured to compare a gradually increasing signal to a predetermined amount, and, when the two values coincide, closing valves, Warren describes a capillary tube having a first end coupled to a water outlet of a valve and having a tip portion within a cup-shaped body portion of a water reservoir such that a quiescent reservoir of water is formed within the body portion, and Mirdadian describes a flowmeter that generates an electrical square wave pulse representative of the passage of a known incremental volume of fluid through a flowline.

Accordingly, for at least the reasons set forth above, Claim 10 is respectfully submitted to be patentable over Gadini in view of Whipple, Warren, and Mirdadian.

When the recitations of Claims 11-13 are considered in combination with the recitations of Claim 10, Applicants submit that Claims 11-13 likewise are patentable over Gadini in view of Whipple, Warren, and Mirdadian.

Claim 14 recites a dishwasher comprising "a wash chamber; a water supply line in flow communication with said wash chamber, said water supply line having a first diameter; a valve and a turbine ratemeter positioned to deliver a metered amount of water into said wash chamber, said turbine ratemeter generating square wave pulses each representing a predetermined quantity of water; a restrictor tube in flow communication with said turbine ratemeter, said restrictor tube having a second diameter smaller than said first diameter; and a controller coupled to said valve and said turbine ratemeter, said controller configured to: deliver a first amount of water to the dishwasher for a first dishwashing cycle; monitor at least one operation of the dishwasher during the first dishwashing cycle to detect an underfill condition; add additional water to the dishwasher upon detecting at least one underfill condition during the first dishwashing cycle; measure a first total amount of additional water by counting a first plurality of square wave pulses generated by said turbine ratemeter during addition of the additional water for the first dishwashing cycle; retain the first total amount of additional water added during the first dishwashing cycle; deliver the first amount of water to the dishwasher for a second dishwashing cycle subsequent the first dishwashing cycle; monitor at least one operation of the dishwasher during the second dishwashing cycle to detect an underfill condition; add additional water to the dishwasher upon detecting at least one underfill condition during the second dishwasher cycle; measure a second total amount of additional water by counting a second plurality of square wave pulses generated by said turbine ratemeter during addition of the additional water for the second dishwasher cycle; retain the second total amount of additional water added during the second dishwashing cycle; and determine a second amount of water to deliver to the dishwasher for a third dishwashing cycle subsequent the second cycle using the retained first total amount of additional water and the retained second total amount of additional water."

None of Gadini, Whipple, Warren and Mirdadian, considered alone or in combination, describe or suggest a dishwasher as recited in Claim 14. More specifically, none of Gadini, Whipple, Warren and Mirdadian, considered alone or in combination, describe or suggest a dishwasher that includes a controller configured to measure a first total amount of additional water by counting a first plurality of square wave pulses generated by a turbine ratemeter during addition of the additional water for a first dishwashing cycle and to

measure a second total amount of additional water by counting a second plurality of square wave pulses generated by the turbine ratemeter during addition of the additional water for a second dishwasher cycle. Moreover, none of Gadini, Whipple, Warren and Mirdadian, considered alone or in combination, describe or suggest a dishwasher that includes a controller configured to retain a second total amount of additional water added during a second dishwashing cycle and/or determine a second amount of water to deliver to a dishwasher for a third dishwashing cycle subsequent the second dishwashing cycle. Rather, in contrast to the present invention, Gadini describes storing a predetermined amount of water initially required to fill components of a washing machine and storing a second water quantity corresponding to the same wash cycle to which the predetermined amount of water initially required corresponds, Whipple describes sensing cavitation in a pump motor and controlling a valve to supply an amount of additional water to a dishwasher to reduce the cavitation, Warren describes a capillary tube having a first end coupled to a water outlet of a valve and having a tip portion within a cup-shaped body portion of a water reservoir such that a quiescent reservoir of water is formed within the body portion, and Mirdadian describes a flowmeter that generates an electrical square wave pulse representative of the passage of a known incremental volume of fluid through a flowline.

Accordingly, for at least the reasons set forth above, Claim 14 is respectfully submitted to be patentable over Gadini in view of Whipple, Warren, and Mirdadian.

Claims 15-20 depend from independent Claim 14. When the recitations of Claims 15-20 are considered in combination with the recitations of Claim 14, Applicants submit that Claims 15-20 likewise are patentable over Gadini in view of Whipple, Warren, and Mirdadian.

For at least reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 11-20 be withdrawn.

In view of the foregoing amendment and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully submitted,

Eric T. Krischke

Eric T. Krischke
Registration No. 42,769
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070